Overview

Do you need a direct attached or shared storage solution within your BladeSystem enclosure?

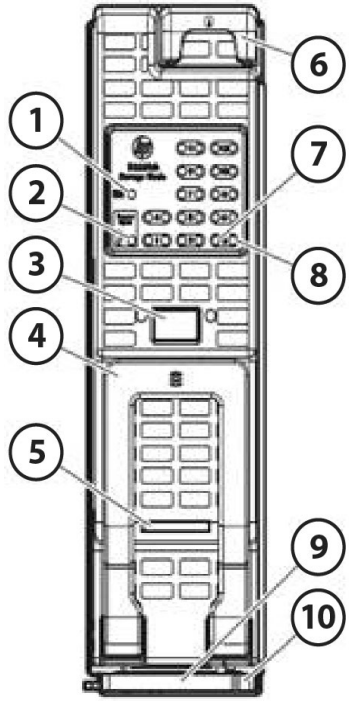
Direct attached storage

The D2220sb Storage Blade delivers direct attached storage for c-Class Gen8 blade servers, with support for up to twelve hot plug small form factor (SFF) SAS or SATA Midline hard disk drives or SAS/SATA SSDs. The enclosure backplane provides a PCI Express connection to the adjacent c-Class server blade and enables high performance storage access without any additional cables. The D2220sb Storage Blade features an onboard Smart Array P420i controller with 2GB flash-backed write cache, for increased performance and data protection. Up to eight D2220sb storage devices can be supported off a single BladeSystem c7000 enclosure for up to 115.2 TB of capacity.

Two ways to create shared storage with the D2220sb

Use HP StoreVirtual VSA software to turn the D2220sb into an iSCSI SAN for use by all servers in the enclosure and any server on the network. HP StoreVirtual VSA software is installed in a virtual machine on a VMware ESX host server adjacent to the D2220sb. HP StoreVirtual VSA turns the D2220sb into a scalable and robust iSCSI SAN, featuring storage clustering for scalability, Network RAID for storage failover, thin provisioning, snapshots, remote replication, and cloning. Expand capacity within the same enclosure or to other BladeSystem enclosures by adding additional D2220sb Storage Blades and HP VSA licenses. A cost effective bundle of the D2220sb Storage Blade and a HP StoreVirtual VSA license makes purchasing convenient. If storage needs increase, add HP P4300 or P4500 systems externally and manage everything via a single pane of glass.

The HP StoreEasy 3830 Gateway Storage Blade is a flexible storage server solution for BladeSystem environments. Combine the StoreEasy 3830 with the D2220sb Storage Blade to enable file serving and iSCSI shared storage inside the BladeSystem enclosure.



1. UID LED
2. Drawer Open LED
3. Hot-plug drive drawer release button
4. Hot-plug drive drawer handle
6. Product information tag
7. Drive fault LED
8. Drive activity LED
9. Storage blade release latch*

Overview

5. Health status LED bar

10. Storage blade release button*

* Removing the storage blade from the enclosure removes power from the hard drives.

What's New

- Supports HP Smart Array P420i controller
- Supports PCIe Gen2
- Supports HP Smart Drive Carriers
- Supports 2GB FBWC
- Supports Active Health System (AHS)
- Supports SAAP 2.0

NOTE : SAAP 2.0 features are now included as part of the base features for HP Smart Array P420i controller

Product Highlights

Key Features	**Features of the D2220sb include:** SFF (SAS/SATA Midline/SAS SSD/SATA SSD) support - Delivering data transfer rates up to 6 Gb/s for SAS, SATA, SAS SSD, SATA SSD • Support for up to twelve (12) hot plug SFF SAS/SATA Midline/SAS SSD/SATA SSD disk drives in a half-height blade • Internal Smart Array P420i with 2 GB flash-backed write cache • Simple configuration and setup with HP Smart Storage Administrator (HP SSA) • Easy to maintain and troubleshoot with industry standard management tools including HP System Insight Manager • Use with HP StoreVirtual VSA software to create a robust shared storage environment inside BladeSystem enclosures • Protected by HP Services and a worldwide network of HP Authorized Channel Partners. Three-year parts limited global warranty. Certain restrictions and exclusions apply
Mix and Match of Hard Drive Types	D2220sb supports mixing of different drive types (SAS/SATA, SSD/HDD) in a single enclosure. However, please note also that an array can be created across only one drive type.
Universal hot plug Hard Drive	Form factor is for use across multiple HP ProLiant servers, disk enclosures and storage systems. With compatibility across many enterprise platforms, you are free to deploy and re-deploy these drives to quickly deliver increased storage capacity, migrate data between systems, and easily manage spare drives.
LED Indicators	Front panel LEDs indicate drive activity and system health status.
Density	The D2220sb fits into a half height bay on the BladeSystem c3000 and c7000 Enclosure. **NOTE:** c7000 requires 10 fans, storage blade is not supported with 8 fan configuration. c3000 requires 6 fans, storage blade is not supported with 4 fan configuration.
Fault Tolerance	Using the internal Smart Array P420i controller with 2 GB flash-backed write cache, the D2220sb can be configured for RAID levels 0, 1, 1 + 0, 5, and 6 (RAID ADG)
Manageability	All Smart Array products utilize a standard set of management and utility software. These tools minimize Total Cost of Ownership (TCO) by reducing training requirements and technical expertise necessary to install and maintain the HP server storage.

Product Highlights

Fault Prevention

The following features offer detection of possible failures before they occur, allowing preventive action to be taken:

- S.M.A.R.T.: Self Monitoring Analysis and Reporting Technology first developed at HP detects possible hard disk failure before it occurs, allowing replacement of the component before failure occurs.
- Drive Parameter Tracking monitors drive operational parameters, predicting failure and notifying the administrator.
- Dynamic Sector Repairing continually performs background surface scans on the hard disk drives during inactive periods and automatically remaps bad sectors, ensuring data integrity.
- Smart Array Cache Tracking monitors integrity of controller cache, allowing pre-failure preventative maintenance.
- Environment Tracking for External Storage System: Monitors fan speed and cabinet temperature of ProLiant Storage System and newer HP storage enclosures.

D2220sb Blade server support matrix

Supported Servers	Server: Full Height or Half Height	No of D2220sb Storage blades Supported	Pass Thru Card Required	Mezz slot to support 1st Pass Thru Card	Mezz slot to support 2nd Pass Thru Card
X86 server blades					
BL460c Gen8	**Half**	**1**	**No**	**n/a**	**n/a**
BL465c Gen8*	**Half**	**1**	**No**	**n/a**	**n/a**
BL660c Gen8	**Full**	**2**	**No**	**n/a**	**n/a**
WS460c Gen8	**Half**	**1**	**No**	**n/a**	**n/a**

***NOTE:** For BL465c Gen8 , SPLD/CPLD FW 0x40 or higher is required to support D2220sb.

Operating Systems

Windows Server: 2008 R2, 2012
Red Hat Enterprise: RHEL5, RHEL6
SLES (x86): SLES10, SLES11
VMware ESX: 4.1ESXi 5.0

NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: http://www.hp.com/go/supportos.

Product Highlights

Software Suite

Systems Insight Manager

- Powerful server and server options/storage manager tool
- Monitors over 1,200 system wide parameters
- Configuration/Diagnostic Utilities

HP Smart Storage Administrator (HP SSA)

- Powerful Web based configuration utility for all Smart Array controllers
- Provides a graphical view of HP drive array configurations
- Allows for management of multiple arrays over a secure internet connection from anywhere in the world
- Easy to use Wizards for configuration
- Runs offline for all supported Operating Systems and runs online for Windows and Linux. For online configuration of NetWare, use CPQONLIN

HP Option ROM Configuration for Arrays (ORCA)

- A simple method for managing logical drives during system power up by pressing F8 during POST
- Allows the ability to create arrays, logical drives, and assign an online spare drive
- Allows the ability to view and delete logical drives
- Allows the ability to select the boot controller or advanced array configurations use HP SSA

HP Array Diagnostic Utility (ADU)

- In depth diagnostic and reporting utility for all Smart Array controllers
- Runs offline for all supported Operating Systems, and runs online for Windows and Linux

Service and Support, HP Care Pack, and Warranty Information

Warranty

Protected by HP Services and a worldwide network of HP Authorized Channel Partners. D2220sb has three-year parts only limited global warranty (3-0-0). Certain restrictions and exclusions apply.

Hard drive Pre-Failure Warranty: When used with any one of the Smart Array Family controllers and monitored under HP Systems Insight Manager (v4.20 or later), HP hard drives are supported by a Pre-Failure (replacement) Warranty. Hard drives have a one year warranty.

Service and Support

Technology Services for increased uptime, productivity and ROI

Trust HP storage technology experts for every level of service and support. Our integrated portfolio of services for storage help customers reduce costs, optimize data, streamline storage management, and improve backup and recovery. Capitalizing on HP Storage Systems' capabilities requires a service partner who understands your increasingly complex environment. Team with the people who know HP infrastructure hardware and software best-the experienced professionals at HP Services.

Protect your business beyond warranty

Warranty protects against manufacturer defects, however warranty uplifts, such as HP Care Pack Services protect the business-by reducing downtime risks and providing operational consistency for mission-critical and standard business computing.

What HP Storage Technology Services can do for you

HP Storage Technology Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. HP storage lifecycle support services offers a full spectrum of customer care-from technology support to complex migrations to complete managed services.

Choose the right level of support, deployment and integration services

HP support recommendations are designed to help you enhance technology operations and lower risk-and make it easier for you to seek the right balance between affordability and service-level commitments. Depending on your individual support needs, choose from three levels of care that cover the entire lifecycle to better address your needs-Optimized Care, Standard Care, and Basic Care. If none of our support recommendations meet your needs, we can tailor a service solution for your unique support requirements. Only HP brings together deep expertise, proactive and business critical support and a strong partner network-together with, a full set of infrastructure services designed to power a Converged Infrastructure.

Optimized Care- delivers best performance and stability through deployment and proactive management practices

HP Proactive Care 24x7- for a higher return on your storage investment, Proactive Care delivers hardware and software support services designed specifically for your technology; rapid access to Advanced Solution Center Specialists plus, Firmware/Software management and best practice advice. Customers can optimize the return on their IT investment and realize the advantage of running their business critical applications on virtualized infrastructure. Plus, HP Proactive Select 20 credits per year, select from an extensive menu of consultancy and technical services, such as onsite firmware upgrades, health checks, assessments, and education.

Additional Option:

HP Proactive Care Personalized Support - The HP Proactive Care Personalized Support option allows for an increased personalization of the Proactive Care support experience through the assignment of an Account Service Manager (ASM) who provides IT best practice advice to help address IT issues and projects. The ASM will develop an annual support plan, provide four days of operational and technical advice, and conduct semi-annual support reviews to ensure the Proactive Care service deliverables address the customer's IT priorities. This option is only available for Proactive Care customers and may be purchased

once per environment.

HP Personalized Support Additional Day - Customers who require more time than is provided by the Personalized Support option can elect to purchase additional days through the Personalized Support Additional Day option. The time may be used to provide extra support reviews and/or more operational & technical advice.

Optional HP Care Pack Services that will enhance your HP product experience.

HP BladeSystem c3000 Infrastructure (ICE + OS) Installation & Startup

For customers who need professionally integrated hardware and software BladeSystem implementation:

The HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure provides for the installation of an HP BladeSystem c-Class enclosure, c-Class ProLiant and Integrity server blades, storage blades, SAN switch blades, Virtual Connect modules (Ethernet and Fibre Channel), Ethernet network interconnects, and Infiniband, as well as deployment and basic configuration of HP Insight Control Environment for HP BladeSystem software.

Service benefits

- Efficient and effective HP BladeSystem c-Class infrastructure setup, server deployment, and management
- Delivery of the service at a mutually scheduled time convenient to your organization
  - Expedited installation, provided all service prerequisites are met prior to commencement of service
- Verification prior to installation that all service prerequisites are met
- Reduced implementation time and cost
- More effective IT resource planning
- Increased data-center efficiency through reduction of manually intensive tasks
- Allows IT resources to stay focused on their core tasks and priorities
- Helps improve IT infrastructure uptime
- Automated diagnosis and remote support for hardware problems (via HP Service Essentials Remote Support Pack)

http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-5964ENW

Standard CareHP Proactive Select Service

HP Proactive Care 24x7- for a higher return on your storage investment, Proactive Care delivers hardware and software support services designed specifically for your technology; rapid access to Advanced Solution Center Specialists plus, Firmware/Software management and best practice advice. Customers can optimize the return on their IT investment and realize the advantage of running their business critical applications on virtualized infrastructure. **Plus, HP Proactive Select 10 credits per year,** select from an extensive menu of consultancy and technical services, such as onsite firmware upgrades, health checks, assessments, and education.

Additional Option:

HP Proactive Care Personalized Support - The HP Proactive Care Personalized Support option allows for an increased personalization of the Proactive Care support experience through the assignment of an Account Service Manager (ASM) who provides IT best practice advice to help address IT issues and projects. The ASM will develop an annual support plan, provide four days of operational and technical advice, and conduct semi-annual support reviews to ensure the Proactive Care service deliverables address the customer's IT priorities. This option is only available for Proactive Care customers and may be purchased once per environment.

HP Personalized Support Additional Day - Customers who require more time than is provided by the Personalized Support option can elect to purchase additional days through the Personalized Support Additional Day option. The time may be used to provide extra support reviews and/or more operational &

	technical advice.
Basic Care-Minimum recommended support Related Services	
HP Entry Storage Data Migration Service for Windows	For customers who need to safely migrate Windows data within their TCP/IP networks with minimal impact to their operations: You have a need to migrate data between Windows servers within your TCP/IP network. Or you have a need to migrate storage for your Windows servers. Or both. And you need to accomplish these migrations efficiently while minimizing risk at the same time. HP Entry Storage Data Migration Service for Windows offers you a cost competitive and convenient way to accommodate data migration triggered by a need to refresh or consolidate storage, or to create different storage tiers. This service offers a migration cost in line with the costs of storage products in small and medium-sized storage environments. The service is delivered via a skilled HP service specialist with special consideration for data availability, integrity, and ongoing operational performance during the transfer process. http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA2-4734ENW.pdf
Standard Care- maintains high level of uptime, along with expert help to cut the cost and complexity of implementation and support	**HP Proactive Care 24x7-** for a higher return on your storage investment, Proactive Care delivers hardware and software support services designed specifically for your technology; rapid access to Advanced Solution Center Specialists plus, Firmware/Software management and best practice advice. Customers can optimize the return on their IT investment and realize the advantage of running their business critical applications on virtualized infrastructure. Plus, HP Proactive Select 10 credits per year, select from an extensive menu of consultancy and technical services, such as onsite firmware upgrades, health checks, assessments, and education. **Additional Option:** **HP Proactive Care Personalized Support** - The HP Proactive Care Personalized Support option allows for an increased personalization of the Proactive Care support experience through the assignment of an Account Service Manager (ASM) who provides IT best practice advice to help address IT issues and projects. The ASM will develop an annual support plan, provide four days of operational and technical advice, and conduct semi-annual support reviews to ensure the Proactive Care service deliverables address the customer's IT priorities. This option is only available for Proactive Care customers and may be purchased once per environment. **HP Personalized Support Additional Day** - Customers who require more time than is provided by the Personalized Support option can elect to purchase additional days through the Personalized Support Additional Day option. The time may be used to provide extra support reviews and/or more operational & technical advice.

Service and Support, HP Care Pack, and Warranty Information

Basic Care-Minimum recommended support

HP Support Plus 24 plus 10 Proactive Select credits per year - This support service is designed for environments where proactive help from HP is not required. HP provides 24x7 hardware and software support onsite, including third-party support with a maximum 4-hour onsite response. We also provide cost-saving software updates and monitor ongoing operations through the latest remote tools. Choose from an extensive menu of HP Proactive Select event and technical services, such as onsite firmware upgrades, health checks, assessments, and education.

Additional Option:

HP 10 Proactive Select credits per year -HP Proactive Select is a flexible way to purchase services to fit your particular environment or situation. Working with an HP Account Support Manager, you select a package of services in the form of services credits that include proactive services spanning many technologies and processes, such as on-site firmware upgrades, health checks, assessments, and education. You tailor the service delivery to improve time to production, optimize performance, or build in continuous improvements.

Implementation

Installation:
Whichever level of care you select, consider our Installation and Startup Services for a smooth implementation: Basic Hardware installation

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Related Services

HP Storage Efficiency Analysis: The HP Storage Efficiency Analysis provides customers with a view of their storage infrastructure and operating environment; highlighting recommendations for improvements. The report provides extensive insight about the existing storage environment, opportunities for efficiency gains, asset aging and replacement through interaction with key decision makers.

HP Storage Impact Analysis: The HP Storage Impact Analysis service provides a 2-4 week discovery engagement with executive summary presentation. The goal of this service is to help provide customers guidance on storage related issues and develop remediation plans. The service is also design to assist and the remediation efforts.

HP Storage Modernization Service: The HP Storage Modernization service is a 4-6 week service that defines the customers envisioned target storage environment based on a proven solution design methodology. HP architects will quickly perform tool-assisted automatic discovery and facilitate a two-day strategy workshop with all key stakeholders involved in the storage infrastructure initiative.
HP Storage Data Migration Service- HP expertise and tools help you migrate data across your data center or around the globe. Take the burden of migration off your shoulders and put it in the capable hands of expert HP storage migration consultants. Our proven approach helps orchestrate the complete data migration and consolidation process while maintaining consistent data availability during the transfer process.
http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-0774ENW.pdf

HP Proactive Select -HP Proactive Select is a flexible way to purchase services to fit your particular environment or situation. Working with an HP Account Support Manager, you select a package of services in the form of services credits that include proactive services spanning many technologies and processes, such as onsite firmware upgrades, health checks, assessments, and education. You tailor the service delivery to improve time to production, optimize performance, or build in continuous improvements.

Service and Support, HP Care Pack, and Warranty Information

For more information

www.hp.com/services/storage
To learn more on HP Storage Services, please contact your HP sales representative or HP Authorized Channel Partner

HP Care Pack Services are sold by HP and HP Authorized Service Partners:
Services for customers purchasing from HP or an enterprise reseller are quoted using HP order configuration tools.
Customers purchasing from a commercial reseller can find HP Care Pack Services at
www.hp.com/go/lookuptool

Configuration Information - Factory Integrated Models (North America Only)

Step 1: D2220sb Storage Blade Configuration

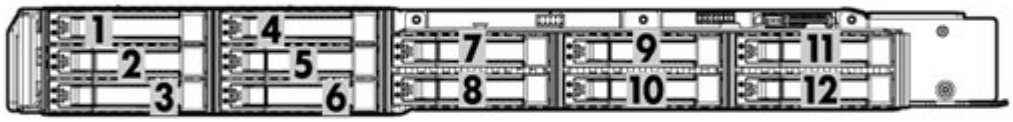
Models	HP D2220sb Configure-to-order Storage Blade **NOTE:** Includes 3yr NBD Parts-Only Warranty Service	QW918A
	HP D2220sb Build-to-order Storage Blade **NOTE:** Includes 3yr NBD Parts-Only Warranty Service	QW917A
	HP D2220sb PCIe w/(12) 900 GB 6G SAS HDD Bundle **NOTE:** Includes 3yr NBD Parts-Only Warranty Service for D2220sb hardware	QW915A
	HP D2220sb PCIe and StoreVirtual VSA Bundle **NOTE:** Includes the D2220sb Storage Blade and a single HP StoreVirtual VSA license. VSA software is installed in a virtual machine on a VMware ESX/ESXi & Microsoft Hyper-V host server adjacent to the D2220sb. **NOTE:** Includes 3yr NBD Parts-Only Warranty Service for D2220sb hardware **NOTE:** Includes 3yr 9x5 remote technical support for HP StoreVirtual VSA software and free updates **NOTE:** HP StoreVirtual VSA is supported on VMware ESX/ESXi & Microsoft Hyper-V http://bizsupport1.austin.hp.com/bc/docs/support/SupportManual/c01729139/c01729139.pdf	QW914A

Options

HP Hard Drives	**SATA Hot Plug Enterprise Mainstream Solid State Drives**	
	HP 100GB 3G SATA MLC SFF (2.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653112-B21
	HP 200GB 3G SATA MLC SFF (2.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653118-B21
	HP 400GB 3G SATA MLC SFF (2.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653120-B21
	NOTE: SATA MLC SSD drives have 3 year warranty.	
	SATA Hot Plug SFF (2.5-inch) Midline (MDL) Drives	
	HP 500GB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655708-B21
	HP 1TB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655710-B21
	SAS Hot Plug SFF Enterprise (ENT) Drives	
	HP 146GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652605-B21
	HP 300GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652564-B21
	HP 300GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652611-B21
	HP 450GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652572-B21
	HP 600GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652583-B21
	HP 900GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652589-B21
	HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	697574-B21
	HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) SC Dual Port Enterprise 3yr Warranty Hard Drive	718162-B21
	NOTE: SAS drives have a 3 year warranty. **NOTE:** Please see the for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html (Worldwide)	
	NOTE: Go to the HP Hard Drive Compatibility table for complete drive compatibility information (http://www.hp.com/products/harddiskdrives). Using hard drives in unsupported configurations will result in voiding the warranty and could result in damage to the drive and/or loss of data.	
	6G SAS Hot Plug Enterprise Performance Solid State Drives	
	HP 200GB 6G SAS SLC SFF (2.5-inch) SC Enterprise Performance 3yr Warranty Solid State Drive	653078-B21
	HP 400GB 6G SAS SLC SFF (2.5-inch) SC Enterprise Performance 3yr Warranty Solid State Drive	653082-B21
	NOTE: SAS SSD drives have a 3 year warranty.	
	6G SATA ME Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives	
	HP 800GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691868-B21
	HP 400GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691866-B21
	HP 200GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691864-B21

Options

HP 100GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691862-B21
6G SAS ME Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives	
HP 800GB 6G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	690829-B21
HP 400GB 6G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	690827-B21
HP 200GB 6G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	690825-B21
SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives	
HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	652745-B21
HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	652749-B21



Top view of the D2220sb, with the drive drawer opened

Hard Drives

SAS Hot Plug SFF Enterprise (ENT) Drives

Quantity Supported	Position Supported	Controller
12	1-12	Smart Array P420i Controller

Technical Specifications

HP D2220sb Storage Blade	**Dimensions** (HxWxD)	5.471cm x 18.070cm x 51.659cm (2.154" x7.114" x 20.338")	
	Weight (unloaded)	4.18 KG (9.22 lbs)	
	Weight (loaded)	7.10 KG (15.65 lbs)	
	Protocol Support	6Gb/s SAS	
	O/S Support	Defined by specific HP array controller or SAS/ adapter used; please refer to the QuickSpecs and/or User Guide of the specific array controller or adapter	
	LED Indicators	UID	
		System Health LED	
	Drive LED Indicators (on drive trays)	Drive LED (top) - On-line/Activity	
		Drive Failure LED (bottom) - Drive Fault/Locate	
	Relative Humidity (non-condensing)	Operating	20% to 80%
		Shipping	5% to 95%
	Temperature Range	Operating	50° to 95° F (10° to 35° C°)
		Shipping	-22° to 140° F (-30° to 60° C)
	NOTE: To maintain proper cooling and airflow, a drive blank or drive must occupy all bays during operation.		
	Power Consumption	12V/11A	

Smart Array P420i Controller	**Disk Drive and Enclosure Interface**	6G SAS (Serial Attached SCSI)
	SAS Connectors	2 internal (SFF8484) x4 wide port connectors
	Cache Memory Speed	Embedded 72-bit DDR3 FBWC provides up to 4.2 GB/s maximum bandwidth.
	SAS Speed	x8 6G SAS
	Cache Memory	2 GB embedded flash-backed write cache; ECC protection, battery-backed, and transportable
	Logical Drives Supported	Up to 32 logical drives
	Maximum Logical Drive Capacity	14.4TB SAS or 12TB SATA
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	RAID Support	RAID 6 with ADG (Advanced Data Guarding)
		RAID 5 (Distributed Data Guarding)
		RAID 1+0 (Striping & Mirroring)
		RAID 0 (Striping)
	Upgradeable Firmware	Upgradeable Firmware with recovery ROM feature

Technical Specifications

Environment-friendly Products and Approach	**End-of-life Management and Recycling**	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.